

Claims

1. A hybrid drive for a motor vehicle with a drive train (1), comprising

- a combustion engine (2) and a vehicle transmission (3) with variable gear ratio and

5 - a first and second electrical machine (4, 6) which can be operated both as a motor and a generator, each of which comprises a stator (34, 44) and a rotor (38, 48), with

- the second electrical machine (6) being in a permanent nonpositive connection with an input (5) of the vehicle transmission,

- with a shiftable clutch (7, 8) each being arranged between the electrical machines (4, 6)

10 and the drive shaft of the combustion engine (2), and with

- the electrical machines (4, 6) to be connected with each other and/or an electrical energy source (12) via a power actuation control (11), characterised in that

- the two electrical machines (4, 6) are to be arranged in a common housing (20), and

15 - one of the stators (34, 44) of the electrical machines (4, 6) together with the power actuation control (11) and/or the other stator (44) is accommodated on a common carrier (22).

2. The hybrid drive for a motor vehicle according to Claim 1, characterised in that

- the common carrier (22) comprises a cooling means (52) for cooling the stator(s) (34, 44) or the power actuation control (11), respectively.

3. The hybrid drive for a motor vehicle according to Claim 1 or 2, characterised in that

- the carrier (22) has an essentially hollow cylindrical portion, with the one stator being arranged at its inner wall (24) and the other stator being arranged at its outer wall (26).

4. The hybrid drive for a motor vehicle according to one of Claims 1 to 3, characterised in that

25 - both stators are arranged either at the inner wall or at the outer wall of the common carrier (22).

5. The hybrid drive for a motor vehicle according to one of Claims 1 to 4, characterised in that

30 - the hollow cylindrical portion of the carrier (22) has an essentially circular or polygonal ring-shaped cross section.

6. The hybrid drive for a motor vehicle according to one of Claims 1 to 5, characterised in that

- the carrier (22) accommodates a hydraulic manifold plate (70) at its inner wall (24) and/or its outer wall (26).

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7. The hybrid drive for a motor vehicle according to one of Claims 1 to 6, characterised in that

- the first shiftable clutch (7) and the first electrical machine (4) and the second shiftable clutch (8) and the second electrical machine (6) are arranged in series in the drive train (1) between the combustion engine (2) and the vehicle transmission (3).

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8. The hybrid drive for a motor vehicle according to one of Claims 1 to 6, characterised in that

- the first shiftable clutch (7) and the first electrical machine (4) are arranged in a parallel side train (9) which branches off the drive train (1) between the combustion engine (2) and the second shiftable clutch (8) in such a manner, that the first electrical machine (4) can be disengaged from the combustion engine (2) by the first clutch (7) and the second electrical machine (6) by the second clutch (8).

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9. The hybrid drive for a motor vehicle according to one of Claims 1 to 8, characterised in that

- the first electrical machine (4) is connected with a hydraulic pump (10) of the vehicle transmission (3).

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10. The hybrid drive for a motor vehicle according to one of Claims 1 to 8, characterised in that

- the first electrical machine (4) is connected with one or several auxiliary units of the motor vehicle for driving same.

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11. The hybrid drive for a motor vehicle according to one of Claims 1 to 10, characterised in that

- the second electrical machine (6) has a higher power consumption/output than the first electrical machine (4).

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12. The hybrid drive for a motor vehicle according to one of Claims 1 to 11, characterised in that

- the vehicle transmission is an automatic transmission (3).

13. The hybrid drive for a motor vehicle according to one of Claims 1 to 12, characterised in that

- the power actuation control (11) is divided into several modules (36) each of which being electrically connected with at least one of the stator and/or rotor coils (22, 24), with the modules (36) being arranged distributed at the circumference of the electrical machine and coupled with the cooling means of the carrier (22) in a thermally conductive manner.

14. The hybrid drive for a motor vehicle according to one of Claims 1 to 13, characterised in that

- the modules (36) of the power actuation control (11) are radially arranged at the outside of the cooling means.

15. The hybrid drive for a motor vehicle according to one of Claims 1 to 14, characterised in that

- the cooling means is formed by fluid channels (32) crisscrossing the carrier (22).

16. The hybrid drive for a motor vehicle according to one of Claims 1 to 15, characterised in that

- the carrier (22) comprises at least one opening (54) to at least one of the fluid channels (52), into which cooling elements (58) protrude which are arranged at one of the modules (36) of the electronic control circuit.

17. The hybrid drive for a motor vehicle according to one of the previous claims, characterised in that

- the cooling elements (58) protruding into the fluid channels (52) and/or the wall of the fluid channels (52) are designed in such a manner that they cause a turbulent flow in the fluid flowing in the fluid channels (52).